

SEQUENCE LISTING

<110> BIOPROTEIN TECHNOLOGIES

<120> PREPARATION OF RECOMBINANT ROTAVIRUS PROTEINS IN MILK OF TRANSGENIC NON-HUMAN MAMMALS

<130> D21684

<150> EP 04/290 589

<151> 2004-03-04

<160> 23

<170> PatentIn version 3.3

<210> 1

<211> 2643

<212> DNA

<213> rotavirus

<220>

<223> VP2 strain RF open reading frame

<400> 1

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| cttccaaaga | aagaggaagt | cgtaaccgac | agtcaagaag | aaattaaaat | tgcgtatgaa | 180 |
| gtgaagaaat | cgacgaaaga | agaatctaaa | caattgcttg | aagtttgaa | aacaaaagaa | 240 |
| gagcacccaa | aagagataca | atatgaaatt | ttgcaaaaaaa | cgataccaac | atttgaacca | 300 |
| aaagagtcaa | tattgaaaaa | attggaggat | atcaaaccgg | aacaagcgaa | gaagcagact | 360 |
| aagctattta | aatatttga | accgagacag | ctaccaattt | atagagcgaa | tgtgaaaaaa | 420 |
| gagttgcgta | acagatggta | ttggaagctg | aagaaagata | ctttaccaga | tggagattat | 480 |
| gatgttagag | aatactttct | aaatttgtat | gatcaggttc | ttactgaaat | gccagattat | 540 |
| ttactattaa | aagatatggc | agttgaaaat | aaaaattcga | gagatgccgg | taaagtgtt | 600 |
| gattctgaaa | cagcaagtat | ctgtgatgct | atatttcaag | atgagggaaac | agaagggtcga | 660 |
| gtgagacgat | tcattgcgga | gatgagacag | cgcgtacaag | ctgacagaaa | cgttgtcaat | 720 |
| tacccatcaa | tattgcatcc | aatagattac | gcttttaatg | agtattttt | gcaacaccaa | 780 |
| ttagttgaac | cattgaataa | tgtatataata | ttcaattaca | tccctgaaag | gataaggaat | 840 |
| gacgttaact | atataacttaa | tatggacaga | aatctgccat | caacagctag | atataataaga | 900 |
| cctaatttac | tacaagacag | actgaatttg | catgacaatt | ttgaatcctt | gtgggataca | 960 |
| ataacaactt | caaactatat | tctggcaaga | tcggtagtac | cagattaaa | ggaatttagtt | 1020 |
| tcaaccgaag | cgcaaattca | aaaaatgtca | caagacttgc | aactagaagc | attaacaata | 1080 |
| cagtcaaaaa | cgcagttttt | aacaggtata | aactcacaag | cagcaatga | ctgtttcaaa | 1140 |
| actctgattt | cagcaatgtt | aagtcaacga | accatgtcgc | ttgatttcgt | gactacaaat | 1200 |
| tatatgtcat | taatttcagg | catgtggta | ctaactgtag | tgccaaatga | catgttcata | 1260 |
| agggaatcat | tggttgcatt | tcaactggct | atagtgaata | caataatata | tccagcgttc | 1320 |
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| caacaaatac | aaaatttca | agtagcgaat | tggctgcatt | ttgtcaataa | caatcaattt | 1440 |
| agacaagtag | ttatttgcatt | tgtatttgcatt | caggtgctga | atgacaatat | tagaaatgga | 1500 |
| catgtcatta | atcaattgtat | ggaagcttta | atgcaactat | cacgacaaca | gttccaaca | 1560 |
| atgcctgtt | attataagag | gtcaatccag | cgttgcattat | tattgcttac | aaataggctt | 1620 |
| ggtcaatttgc | ttgatttac | tagtttattt | gcttacaact | acgaaacact | aatggcatgt | 1680 |
| gttacgttgc | atatgcacaa | tggttgcatt | ttgacaacag | aaaaatttaca | gttacttca | 1740 |
| gtcacatgtt | tgtgtatgtt | tattggaaat | gcaaccgtt | tacccagccc | gcagacattt | 1800 |
| tttcacttatt | ataatgtttaa | tgttattttt | cattcaattt | ataatgaaag | atataatgtat | 1860 |
| gcagtggcca | taataactgg | agctaataga | ctaaattttat | atcagaaaaaa | gatgaaggca | 1920 |
| atagttaag | attttttaaa | aagattacat | attttcgtat | tagcttagat | tccagatgtat | 1980 |
| caaattgtata | gattaaggga | tagactacga | ctattgcccag | tagaagtaag | acgattggat | 2040 |

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| caaggttta | ttattgcgt | ccgcgatatg | caattggaaa | gagacgaaat | gtatggctac | 2160 |
| gtaatatag | ctagaaattt | agatgggtc | cagcaaataa | acctagaaga | attgatgaga | 2220 |
| acaggcgatt | atgcacaaat | aactaacatg | ctcttgaata | atcaaccagt | agcgctagtt | 2280 |
| ggagctttc | catttgcgt | agactcgta | gtcatatcg | tgatagcgaa | cgttgacgct | 2340 |
| acagttttt | cccaaatagt | taaattacgg | aaagttgata | ccttgaacc | aatattgtat | 2400 |
| aaaataaatt | cagattcgaa | tgacttttac | ctagttgcca | actatgattt | ggtgcctact | 2460 |
| tcaaccacaa | aagtatataa | gcaagttcca | cagcaattt | atttcagaaa | ttcgatgcat | 2520 |
| atgttaacat | caaattttac | tttcaactgtt | tactctgatc | tgcttgcat | cgtatcgccc | 2580 |
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<223> VP2 strain RF open reading frame, modified sequence

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| ctttcaaaaga | aagaggaagt | cgtaaccgac | agtcaagaag | aaattaaaat | tgctgtatgaa | 180 |
| gtgaagaaat | cgacgaaaga | agaatctaaa | caattgcttg | aagtttgaa | aacaaaagaa | 240 |
| gagcacccaa | aagagataca | atatgaaatt | ttgcaaaaaa | cgataccaac | atttgaacca | 300 |
| aaagagtcaa | tattgaaaaa | attggaggat | atcaaaccgg | aacaagcgaa | gaagcagact | 360 |
| aagctattta | gaatatttga | accgagacag | ctaccaattt | atagagcgaa | tggtgaaaaa | 420 |
| gagttgcgt | acagatggta | ttggaagctg | aagaaagata | ctttaccaga | tggagattat | 480 |
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| gattctgaaa | cagcaagtat | ctgtgtatgct | atatttcaag | atgagggaaac | agaagggtgca | 660 |
| gtgagacgat | tcattgcgga | gatgagacag | cgcgtacaag | ctgacagaaa | cgttgtcaat | 720 |
| tacccatcaa | tattgcatcc | aatagattac | gcttttaatg | agtattttt | gcaacaccaa | 780 |
| ttagttgaac | cattgaataa | tgatataata | ttcaattaca | ttcctgaaag | gataaggaat | 840 |
| gacgttaact | atatacttaa | tatggacaga | aatctgccc | caacagctag | atataataaga | 900 |
| cctaatttac | tacaagacag | actgaattt | catgacaatt | ttgaatcctt | gtgggataca | 960 |
| ataacaactt | caaactatat | tctggcaaga | tcggtagtac | cagattaaa | ggaatttagt | 1020 |
| tcaaccgaag | cgcaaattca | aaaaatgtca | caagacttgc | aactagaagc | attaacaata | 1080 |
| cagtcaaaa | cgcaggaaaa | aacaggtata | aactcacaag | cagcaaatga | ctgtttcaaa | 1140 |
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| tttcactatt | ataatgttaa | tgttaatttt | cattcaaattt | ataatgaaag | attaatgtat | 1860 |
| gcagtggcca | taataactgg | agctaataaga | ctaaatttt | atcagaaaaaa | gatgaaggca | 1920 |
| atagttgaag | atttttaaa | aagatttacat | attttgcgt | tagcttagt | tccagatgt | 1980 |
| caaatgtata | gattaaggga | tagactacga | ctattgccc | tagaagtaag | acgattggat | 2040 |
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| acaggcgatt | atgcacaaat | aactaacatg | ctcttgaata | atcaaccagt | agcgctagtt | 2280 |
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| | | | | | | |
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| cttcaaga | aagaggaagt | cgtaaccgac | agtcaagaag | aaattaaaat | tgctgtatgaa | 180 |
| gtgaagaaat | cgacgaaaga | agaatctaa | caattgctt | aagtttgaa | aacaaaagaa | 240 |
| gagcaccaa | aagagataca | atatgaaatt | ttgaaaaaa | cgataccaa | atttgaacca | 300 |
| aaagagtca | tattgaaaaa | attggaggat | atcaaaccgg | aacaagcgaa | gaagcagact | 360 |
| aagctattt | aatatttga | accgagacag | ctaccaattt | atagagcgaa | tggtaaaaaa | 420 |
| gagttgcgt | acagatggta | ttgaaagctg | aagaaagata | ctttaccaga | tggagattat | 480 |
| gatgttagag | aatactttct | aaatttgtat | gatcaggttc | ttactgaaat | gccagattat | 540 |
| ctccctcctg | aagatatggc | agttaaaaat | aagaattcga | gagatccgg | taaagttgtt | 600 |
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| tacccatcaa | tattgatcc | aatagattac | gcttttaatg | agtattttt | gcaacaccaa | 780 |
| ttagttgaac | cattgataa | tgatataata | ttcaattaca | ttcctgaaag | gataaggaat | 840 |
| gacgttaact | atatacttaa | tatggacaga | aatctgccc | caacagctag | atataataaga | 900 |
| cctaatttac | tacaagacag | actgaattt | catgacaatt | ttgaatcctt | gtgggataca | 960 |
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| cagtcaaaa | cgcagttttt | aacaggtata | aactcacaag | cagcaatga | ctgtttcaaa | 1140 |
| actctgattt | cagcaatgtt | aagtcaacga | accatgtcgc | ttgatttcgt | gactacaaat | 1200 |
| tatatgtcat | taatttcagg | catgtggta | ctaaactgtag | tgccaaatga | catgttcata | 1260 |
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| caacaaatac | aaaatttca | agtagcgaat | tggctgcatt | ttgtcaataa | caatcaattt | 1440 |
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| atgcctgtt | attataagag | gtcaatccag | cgttgcataat | tattgcatac | aataggctt | 1620 |
| ggtcaattt | ttgatatttac | taggttatta | gcttacaact | acgaaacact | aatggcatgt | 1680 |
| gttacgtat | atatgcaaca | tggttgcact | ttgacaacag | aaaaatttaca | gttaacttca | 1740 |
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| tttcactatt | ataatgtttaa | tgttattttt | cattcaaatt | ataatgaaag | atataatgtat | 1860 |
| gcagtggcca | taataacttgg | agctaataga | ctaaatttt | atcagaaaaa | gatgaaggca | 1920 |
| atagttgaag | atttttaaa | aagatttacat | attttgcatt | tagcttagt | tccagatgtat | 1980 |
| caaatgtata | gattaaggga | tagactacga | ctattgccc | tagaagttaa | acgattttggat | 2040 |
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| caaggtgtt | ttatttgcgt | ccgcgtat | caattggaaa | gagacgaaat | gtatggctac | 2160 |
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| acaggcgatt | atgcacaaat | aactaacat | ctcttgcata | atcaaccagt | agcgctagtt | 2280 |
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| atgttaacat | caaatcttac | tttcaactgtt | tactctgatc | tgcttgcat | cgtatcggcc | 2580 |
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2643

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<220>

<223> VP2 strain RF open reading frame, modified sequence

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| caagagaaaag | atgacgagaa | acaagatcaa | aacaatagaa | tgcatgtgtc | tgataaaagta | 120 |
| cttcaaaaga | aagaggaagt | cgtaaccgcac | agtcaagaag | aaattaaaat | tgctgatgaa | 180 |
| gtgaagaaat | cgacgaaaaga | agaatctaaa | caattgttttg | aagttttgaa | aacaaaagaa | 240 |
| gagcaccaaa | aagagataca | atatgaaatt | ttgcaaaaaaa | cgataaccaac | atttgaacca | 300 |
| aaagagtcaa | tattgaaaaaa | attggaggat | atcaaaccgg | aacaagcga | gaagcagact | 360 |
| aagctattta | gaatatttga | accgagacag | ctaccaattt | atagagcga | ttgtgaaaaaa | 420 |
| gagttgcgt | acagatggta | ttgaaagctg | aagaaagata | ctttaccaga | ttggagattat | 480 |
| gatgttagag | aatactttct | aaatttgtat | gatcaggttc | ttactgaaat | gccagattat | 540 |
| ttactattaa | aagatatggc | agttaaaaat | aagaattcga | gagatgccgg | taaagtttt | 600 |
| gattctgaaa | cagcaagtat | ctgtgtatgt | atatttcaag | atgagggaaac | agaagggtca | 660 |
| gtgagacgt | tcattgcgg | gatgagacag | cgcgtacaag | ctgacagaaaa | cgttgtcaat | 720 |
| tacccatcaa | tattgcatcc | aatagattac | gctttatgt | agtattttt | gcaacaccaa | 780 |
| ttagttgaac | cattgaataa | tgatataata | ttcaattaca | ttcctgaaag | gataaggaat | 840 |
| gacgttaact | atatacttaa | tatggacaga | aatctgcatt | caacagctag | atataataaga | 900 |
| cctaatttac | tacaagacag | actgaatttgc | catgacaattt | ttgaatcctt | gtgggataca | 960 |
| ataacaactt | caaactatata | tctggcaaga | tcggtagtac | cagatttaaa | ggaatttagtt | 1020 |
| tcaaccgaag | cgcaatttca | aaaaatgtca | caagacttgc | aactagaagc | attaacaata | 1080 |
| cagttagaaa | cgcagttttt | aacaggtata | aactcacaag | cagcaatga | ctgtttcaaa | 1140 |
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| tatatgtcat | taatttcagg | catgtggta | ctaactgttag | tgccaaatga | catgttcata | 1260 |
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| ggaatgcaac | gaatgcatta | tagaaacgga | gaccacaaa | gaccattca | gatagcagaa | 1380 |
| caacaaatac | aaaattttca | agtagcgaat | tggctgcatt | ttgtcaataa | caatcaattt | 1440 |
| agacaagtag | ttatttgcatt | tgtattgaat | caggtgtcga | atgacaatata | tagaaatgga | 1500 |
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| ggtaatttt | ttgatttaac | tagtttattt | gcttacaact | acgaaacact | aatggcatgt | 1680 |
| gttacgtat | atatacaaca | tgttgcatt | ttgacaacag | aaaaattaca | gttaacttca | 1740 |
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| tttcaattt | ataatgtttaa | tgttattttt | cattcaattt | ataatgaaag | attaatgtat | 1860 |
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| acagtttttgc | cccaaatatgt | taaatttgcatt | aaagttgtat | ccttgcattt | aatattttgtat | 2400 |
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| caagagaaag | atgacgagaa | acaagatcaa | aacaatagaa | tgcagttgtc | tgataaaagta | 120 |
| ctttcaaaga | aagagagaagt | cgtaaccgac | agtcaagaag | aaattaaaat | tgcgtatgaa | 180 |
| gtgaagaaat | cgacgaaaga | agaatctaaa | caattgcttg | aagttttgaa | aacaaaaagaa | 240 |
| gagcaccaaa | aagagataca | atatgaaatt | ttgcaaaaaaa | cgataccaaac | atttgaacca | 300 |
| aaagagtcaa | tattgaaaaaa | attggaggat | atcaaaccgg | aacaagcgaa | gaagcagact | 360 |
| aagctattta | gaatatttga | accgagacag | ctaccaattt | atagagcgaa | tgtgtaaaaaa | 420 |
| gagttgcgt | acagatggta | ttggaagctg | aagaaaagata | ctttaccaga | tggagattat | 480 |
| gatgttagag | aatactttct | aaatttgtat | gatcaggttc | ttactgaaat | gccagattat | 540 |
| ctcctcctga | aagatatggc | agttgaaaaat | aagaattcga | gagatgccgg | taaagtgtt | 600 |
| gattctgaaa | cagcaagtat | ctgtgtatgt | atatttcaag | atgagggaaac | agaagggtgca | 660 |
| gtgagacgt | tcattgcgga | gatgagacag | cgcgtacaag | ctgacagaaa | cgttgtcaat | 720 |
| tacccatcaa | tattgcattc | aatagattac | gcttttaatg | agtattttt | gcaacaccaa | 780 |
| ttagttgaac | cattgaataa | tgatataata | ttcaattaca | ttcctgaaag | gataaggaat | 840 |
| gacgttaact | ataacttaa | tatggacaga | aatctgccc | caacagctag | atataataaga | 900 |
| cctaatttac | tacaagacag | actgaatttgc | catgacaattt | ttgaatccctt | gtgggataca | 960 |
| ataacaactt | caaactat | tctggcaaga | tcggtagtac | cagattaaa | ggaatttagtt | 1020 |
| tcaaccgaag | cgcaaattca | aaaaatgtca | caagacttgc | aactagaagc | attaacaata | 1080 |
| cagttagaaaa | cgcagttttt | acacaggtata | aactcacaag | cagcaatga | ctgtttcaaa | 1140 |
| actctgatttgc | cagcaatgtt | aagtcaacga | accatgtcgc | ttgatttcgt | gactacaaat | 1200 |
| tatatgtcat | taatttcagg | catgtggta | ctaactgttag | tgccaaatga | catgttcata | 1260 |
| agggaatcat | tggttgcatt | tcaactggct | atagtgaata | caataatata | tccagcgttc | 1320 |
| ggaatgcaac | gaatgcatta | tagaaacgga | gaccacaaaa | gaccatttca | gatgcagaa | 1380 |
| caacaaatac | aaaatttca | agtagcgaat | tggctgcatt | ttgtcaataa | caatcaattt | 1440 |
| agacaagtag | ttatttgcatt | tgtatttgcatt | caggtgctga | atgacaat | tagaaatggaa | 1500 |
| catgtcatta | atcaatttgcatt | gaaagcttta | atgcaactat | cacgacaaca | gtttccaaca | 1560 |
| atgcctgttgc | attataagag | gtcaatccag | cgtggatat | tattgcatac | aataggctt | 1620 |
| ggtcaatttgc | ttgatttac | taggttatttgc | gcttacaact | acgaaacact | aatggcatgt | 1680 |
| gttacgtatgc | atatgcaaca | tgttcagact | ttgacaacag | aaaaattaca | gttaacttca | 1740 |
| gtcacatcgt | tgtgtatgc | tatttgcatt | gcaaccgtt | tacccagccc | gcagacatttgc | 1800 |
| tttcactatt | ataatgttac | tgttattttgc | cattcaatttgc | ataatgaaag | aattaatgtatgc | 1860 |
| gcagtggcca | taataacttgc | agctaataaga | ctaaattttgc | atcagaaaaa | gatgaaggca | 1920 |
| atagtgttgc | attttttgc | aagatttgcatt | attttgcatt | tagcttagt | tccagatgtatgc | 1980 |
| caaattgtata | gattaaggga | tagactacga | ctatttgcatt | tagaagtaag | acgattttgc | 2040 |
| attttttgc | tgataacttgc | gaacatggat | cagatagaac | gcgcatttgc | taaaatttgc | 2100 |
| caagggttgc | ttatttgcatt | ccgcatttgc | caatttgcatt | gagacgaaat | gtatggctac | 2160 |
| gtgaatatgc | ctagaaatttgc | agatgggttgc | cagcaatataa | acctagaaga | attgtatgaga | 2220 |
| acaggcgttgc | atgcacaaat | aactaacaatgc | cttttgcatt | atcaaccat | acgcgtatgttgc | 2280 |
| ggagctttgc | catttgcatt | agacttgcatt | gtcatttgcatt | tcatttgcatt | cgttgcgttgc | 2340 |
| acagtttttgc | cccaatttgc | taaatttgcatt | aaagtttgcatt | catttgcatt | aatatttgcatt | 2400 |
| aaaatttttgc | cagatttgcatt | tgacttttgcatt | ctatttgcatt | actatgatttgc | gttgcctact | 2460 |
| tcaaccatgc | aagtatataa | gcaaggtttgc | cagcaatttgc | atttcagaaa | ttcgatgtatgc | 2520 |
| atgttacat | caaatttgcatt | tttgcatt | tacttgcatt | tgcttgcatt | cgatcggttgc | 2580 |
| gatacgtatgc | aacctataaa | tgcagtttgc | tttgcatt | tgcgcatcat | gaacgatgttgc | 2640 |
| taa | | | | | | 2643 |

<210> 6

<211> 2797

<212> DNA

<213> Artificial sequence

<220>

<223> VP2 strain RF open reading frame, modified sequence

and with signal peptide

<400> 6

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| gcccggat | cccaaggccc | aactccccga | accactcagg | gtcctgtgga | cagctcacct | 60 |
| agccgcctat | gctccaggct | cccgacgtc | cctgctcctg | gcttttgcctt | tgctctgcct | 120 |
| gccctggctt | caggaggctg | gcccgtgtat | ggcttacagg | aaacgtggag | cccgccgtga | 180 |
| ggctaatatt | aataataatg | acagaatgca | ggagaaaagat | gacgagaaac | aggatcagaa | 240 |
| caatagaatg | cagctgtctg | ataaaagtct | ttcaaagaaaa | gaggaagtctg | tcaccgcac | 300 |
| tcaggaagaa | attaaaattt | ctgatgaagt | gaagaaatcc | acgaaaagaag | aatctaaaca | 360 |
| gtccttgaa | gttctgaaaa | caaaaagaaga | gcaccagaaa | gagatccagt | atgaaattct | 420 |
| ccagaaaacg | attccaaacat | ttgaacccaa | agagtcaatc | ctgaaaaaac | tcgaggatat | 480 |
| caaaccgaa | caggcgaaga | agcagactaa | gctgtttaga | atttttgaac | ccagacagct | 540 |
| cccaatctat | agagctaattg | gcaaaaaaaa | gctgcgttaac | agatggatt | ggaagctgaa | 600 |
| gaaagatact | ctgcccagatg | gagattatga | tgttagagaa | tactttctga | atctctatga | 660 |
| tcaggttctt | actgaaatgc | cagattatct | cctcctgaaa | gatatggcag | ttgaaaataa | 720 |
| gaatagcaga | gatgcggaa | aagttgttga | ttctgaaaca | gcaagtatct | gtgatgctat | 780 |
| cttcaagat | gaggaaacag | aaggcgcagt | gagaagattc | attgcccaga | tgagacagcg | 840 |
| cgtgcaggct | gacagaaacg | ttgtcaatta | cccatcaatt | ctgcattccaa | tcgattacgc | 900 |
| ttttaatgag | tatttctcc | agcaccagct | cgttgaacca | ctgaaaaatg | atattatctt | 960 |
| caattacatt | cctgaaagga | ttaggaatga | cgttaactat | atccttaata | tggacagaaa | 1020 |
| tctgccatca | acagcttagat | atattagacc | taatctgtcg | caggacagac | tgaatctcca | 1080 |
| tgacaatttt | gaatccctgt | gggatacaat | cacaacttca | aactatattc | tggcaagatc | 1140 |
| cgtcggtcc | gatctcaagg | aactggtttc | aaccgaagct | cagattcaga | aaatgtcaca | 1200 |
| ggacctccag | ctcgaagcac | tcacaattca | gtcagagacg | cagtttctga | caggaatcaa | 1260 |
| ctcacaggca | gcaaatgact | gtttcaaaaac | tctgattgca | gcaatgctca | gtcagagaaac | 1320 |
| catgagcctt | gatttgcgtg | ctacaaaatta | tatgtcactg | atttcaggca | tgtggctcc | 1380 |
| gactgtcggt | ccaaatgaca | tgttcatttag | ggaatcactg | gttgcattgtc | agctggctat | 1440 |
| cgtgaataca | attatctatc | cagcgttccgg | aatgcagaga | atgcattata | gaaacggaga | 1500 |
| cccacagaca | ccatttcaga | ttgcagaaca | gcagatccag | aattttcagg | tggctaattg | 1560 |
| gctgcatttt | gtcaacaaca | atcagtttag | acaggtcggt | attgatggcg | tgctcaatca | 1620 |
| ggtgctgaat | gacaatattt | gaaatggaca | tgtcattat | cagctgatgg | aagctctgtat | 1680 |
| gcagctctca | agacagcagt | ttccaacaat | gcctgtttag | tataagaggt | caatccagcg | 1740 |
| tggaaattctc | ctcctgtcaa | ataggcttgg | acagctgggt | gatctcaactc | ggctgctcgc | 1800 |
| ttacaactac | gaaacactca | tggcatgtgt | tacgatgaat | atgcagcatg | ttcagactct | 1860 |
| gacaacagaa | aaactgcagc | tcacttcagt | cacatccctc | tgtatgctt | ttggaaatgc | 1920 |
| aaccgttatac | cccagcccc | agacactgtt | tcactattac | aatgttaatg | ttaattttca | 1980 |
| ttcaaattat | aatgaaagaa | ttaatgatgc | agtggccatt | atcactgcag | ctaataagact | 2040 |
| gaatctgtat | cagaaaaaga | tgaaggcaat | tgttgaagat | tttctaaaa | gactgcata | 2100 |
| tttcgtatgtc | gttagagttc | cagatgatca | gatgtataga | ctcaggata | gactcagact | 2160 |
| gctcccagtg | gaagtccagaa | gactggatat | ttttaatctc | atcctgatga | acatggatca | 2220 |
| gattgaacgc | gcatcagata | aaattgcccc | ggcggttatt | attgcttacc | gcccataatgc | 2280 |
| gctggaaaga | gacgaaatgt | atggctacgt | gaatatcgct | agaaaatctgg | atggattcca | 2340 |
| gcagattaac | ctcgaagaac | tcatgagaac | aggcgattat | gcacagatca | ctaacatgt | 2400 |
| cctgaataat | cagccagtgg | cgctggttgg | agctttcca | tttggttacag | acagctcagt | 2460 |
| cattccctc | atcgctaagg | ttgacgctac | agtttttgc | cagattgtta | aactcaggaa | 2520 |
| agttgatacc | ctgaaaccaa | tcctctataa | aattaattca | gatagcaatg | acttttac | 2580 |
| cgttgcacac | tatgattggg | tgcctacttc | aaccacaaaa | gtctataagc | aggttccaca | 2640 |
| gcagtttgc | ttcagaaattt | ccatgcata | gctgacatca | aatcttactt | tcactgtttt | 2700 |
| ctcagatctg | cttgcattcg | tgagcgcga | tacagtctgaa | cctatcaatg | cagttgcatt | 2760 |
| tgataatatg | cgcattcatga | acgagctgta | agcgccg | | | 2797 |

<210> 7

<211> 783

<212> DNA

<213> Porcine rotavirus

<220>

<223> VP4 gene for capsid protein, partial cds

<400> 7

<210> 8
<211> 799
<212> DNA
<213> Human rotavirus

<220>
<223> P1B VP4 gene, partial cds

| | |
|---|-----|
| <400> 8 | |
| ccgattcata ttcatgtac ttgcattatg aatagaaca gattggatca gagaaaactc | 60 |
| aaaatgtaac gataaatcca ggtccatgg cacagactag atatgctca gtttaattggg | 120 |
| gacatgggg gattaatgtat ctaactatag tggaaaccagt ttttagatggt ccttatcaac | 180 |
| ccactacgtt caaaccaccc aatgattttt ggctacttat tagctcaa at acagatggag | 240 |
| tagtttatga aagtacaaat aatagtgc tttggacagc agttatcgct gttgaaccac | 300 |
| atgttagtca aacaaataga caatataat tattttggta aaataaagcag tttatata | 360 |
| aaaataattc agataaatgg aaattttgc aaatgttcaa aggttagt cagggtaat | 420 |
| tttctaata agcactcta acttctaata atagactcg aggaaatgcta aaatatgg | 480 |
| gaaaagtatg gacatttcat ggtgaaacgc caagagccac tactgatagg tcagataactg | 540 |
| cggtttaaa taatataatca attataattc attcagagtt ttatatcatt ccaagatctc | 600 |
| aagaatctaa atgtaatgag tatattaata atggtttgc accaattcag aataactagga | 660 |
| acgttgttcc attatctcta tcattccagat ctattcaata taggagagca caagttaatg | 720 |
| aagatattac aatttcaaaa acttcattat ggaaggaaat gcaatgtat agagatatta | 780 |
| taataaagatt taaaatttgg | 799 |

<210> 9
<211> 875
<212> DNA
<213> Human rotavirus

<220>
<223> P3 truncated VP4 protein gene, partial cds

| | | |
|---|--|----|
| <400> 9 | tcgctcattt atagacagtt actatcaaac tcataatgtta caaacatctc tgacgaaatt | 60 |
| aatgaaattg gaactaaaaaa agcaactaac gttactgtta atccagggcc attcgcacaa | 120 | |
| acgggatatg cgcctgtcga ctggggacat ggtgaattgc ctgactctac attagtgc当地 | 180 | |
| ccaactcttg atggtccata ccaacccact tcacttaatt tgccagtcga ttattggatg | 240 | |
| ttaattgcgc ctactagaga agggaaagt gctgaaggta cgaataactac tgacagatgg | 300 | |
| ttcgcttgtg tactagttga gccaaatgtg caaaaatacac aaaggcaata cgtatttagat | 360 | |
| gggcgaaaatg tccaattaca tgtctcaaac gattcaagta cttcgtggaa atttatatta | 420 | |
| ttcattaaat tgacgccccga cggaacgtac actcaatact caaccctgtc aacaccgcat | 480 | |
| aagttatgcg cgtgaatgaa aagagataac agagtatact ggtatcaagg aacgacacccg | 540 | |
| aacgcatcag agagctattt ctgacaata aacaatgaca acagcaacgt ttcaagtgac | 600 | |
| qctqaattcc atttgataacc qcaatcgcaq actqccatgt gtacacaata tataaacaat | 660 | |

| | |
|--|-----|
| ggtttaccac caattcagaa tacaaggaat attgtaccag taaatattac atcttagacag | 120 |
| attaaagaca taagagctca gatgaatgaa gacatagtga tatcaaaaac ttgcgtatgg | 780 |
| aaagaaaatgc aatataatac agatataatc attagattta aatttgcata ttcaataatc | 840 |
| aaatcaggtg ggctaggtttaaaatggtcc gaaat | 875 |

<210> 10
<211> 1194
<212> DNA
<213> rotavirus

<220>
<223> VP6 strain RF open reading frame

| | |
|---|------|
| <400> 10 | |
| atggatgtcc tgtactcctt gtcaaaaact cttaaagatg ctagagacaa aattgtcgaa | 60 |
| ggcacattat actccaatgt aagtgtatca attcaacaat ttaatcaaat gataattact | 120 |
| atgaatggaa atgagttcca aactggagga attggtaatc taccgattag aaatttggaaat | 180 |
| tttgattttg gattacttgg aacaactcta ctaaatttag atgctaacta cgtcgaaacg | 240 |
| gcccccaata caatttgatta tttttagata atgtatgtat ggacgaaatg | 300 |
| gttagagaat cacaagaaa tggaaattgca ccacaatcag attcacttat aaagttatca | 360 |
| ggcattaaat ttaaaagaat aaattttgac aattcatcag aatacataga gaactggaaat | 420 |
| ttgcaaaata gaagacaaag aacgggtttt acatttcata aaccaaacat ttcccttat | 480 |
| tcagttcat tcacgttcaa cagatcacaa ccggctcatg ataacttgat gggtacgatg | 540 |
| tggctcaatg cgggatcaga aattcaggc gctggattcg actactcatg tgcaataaac | 600 |
| gccccagcta atacgcaaca atttgagcat attgtacagc ttcaagggt gttgactaca | 660 |
| gctacaataa ctctttacc agatgcagaa agattttagt ttccaagagt gattacttca | 720 |
| gctgacggag cgactacatg gtacttcaat ccagtgattc ttagacccaa taacgttcaa | 780 |
| atagagtttc tactaaacgg gcagataata aatacttacc aagcaagatt tggaaacgatc | 840 |
| atagctagaa attttgatac aatttagattt tcatttcagt tgatgagacc accaaatatg | 900 |
| acaccagcgg tagcgcgtt atttccaaat ggcgcagccat ttgaacatca cgcaacagta | 960 |
| ggactcacgc tttagaattga atctgcagtt tggatcatg tacttgcga cgcaagcgaa | 1020 |
| acaatgctag caaatgtgac atctgtttaga caagaatacg cgataccagt tggaccagtt | 1080 |
| tttccaccag gtatgaattt gactgattt atcactaact attcaccatc tagagaggat | 1140 |
| aacttgcagc gtgtatttac agtggcttcc attagaagca tgcttgtaa atga | 1194 |

<210> 11
<211> 1194
<212> DNA
<213> Artificial sequence

<220>
<223> VP6 strain RF open reading frame, modified sequence

| | |
|---|-----|
| <400> 11 | |
| atggatgtcc tgtactcctt gtcaaaaact cttaaagatg ctagagacaa aattgtcgaa | 60 |
| ggcacattat actcccaagt cagtgtatca attcaacaat ttaatcaaat gataattact | 120 |
| atgaatggaa atgagttcca aactggagga attggtaatc taccgattag aaatttggaaat | 180 |
| tttgattttg gattacttgg aacaactcta ctaaatttag atgctaacta cgtcgaaacg | 240 |
| gcccccaata caatttgatta tttttagata atgtatgtat ggacgaaatg | 300 |
| gttagagaat cacaagaaa tggaaattgca ccacaatcag attcacttat aaagttatca | 360 |
| ggcattaaat ttaaaagaat aaattttgac aattcatcag aatacataga gaactggaaat | 420 |
| ttgcaaaata gaagacaaag aacgggtttt acatttcata aaccaaacat ttcccttat | 480 |
| tcagttcat tcacgttcaa cagatcacag ccggctcatg ataacctgat gggtacgatg | 540 |
| tggctcaatg cgggatcaga aattcaggc gctggattcg actactcatg tgcaataaac | 600 |
| gccccagcta atacgcaaca atttgagcat attgtacagc ttcaagggt gttgactaca | 660 |
| gctacaataa ctctttacc agatgcagaa agattttagt ttccaagagt gattacttca | 720 |
| gctgacggag cgactacatg gtacttcaat ccagtgattc ttagacccaa taacgttcaa | 780 |
| atagagtttc tactaaacgg gcagataata aatacttacc aagcaagatt tggaaacgatc | 840 |
| atagctagaa attttgatac aatttagattt tcatttcagt tgatgagacc accaaatatg | 900 |

| | | | | | |
|----------------------------------|-----------------------|------------|------------|------------|------|
| acaccagcgg tagcggcgtt atttccaaat | gcccagccat ttgaacatca | cgcaacagt | 960 | | |
| ggactcacgc ttagaattga | atctgcagg tgtgaatcag | tacttgcgcg | cgcaagcgaa | 1020 | |
| acaatgctag caaatgtgac | atctgttaga | caagaatacg | cgataccagt | 1080 | |
| tttccaccag gtatgaattg | gactgatttg | atcactaact | attcaccatc | tagagaggat | 1140 |
| aacctgcagc gtgtatttac | agtggcttcc | attagaagca | tgcttgtcaa | atga | 1194 |

<210> 12
 <211> 1194
 <212> DNA
 <213> Artificial sequence

<220>
 <223> VP6 strain RF open reading frame, modified sequence

| | | | | | | |
|-----------------------|------------|-------------|-------------|-------------|------------|------|
| <400> 12 | | | | | | |
| atggatgtcc tgtactcctt | gtcaaaaact | cttaaagatg | ctagagacaa | aattgtcgaa | 60 | |
| ggcacattat | actccaatgt | aagtgtatca | attcaacaat | ttaatcaa | 120 | |
| atgaatggaa | atgagttcca | aactggagga | attggtaatc | taccgattag | 180 | |
| tttgattttg | gattacttgg | aacaactcta | ctaaatttag | atgctaacta | 240 | |
| gcccgcata | caattgatta | ttttgttagat | ttttagata | atgtatgtat | 300 | |
| gttagagaat | cacaagaaa | ttgaattgca | ccacaatcg | attcacttat | 360 | |
| ggcattaaat | ttaaagaat | aaattttgac | cagtcatacg | aatacataga | 420 | |
| ttgcaaaaata | gaagacaaag | aacgggtttt | acatttcata | aaccaaaacat | 480 | |
| tcagcttcat | tcacgttcaa | cagatcaca | ccggctcatg | ataacttgat | 540 | |
| tggctcaatg | cgggatcaga | aattcaggc | gctggattcg | actactcatg | 600 | |
| gcccagcta | atacgcaaca | atttgagcat | attgtacagc | ttcgaagggt | 660 | |
| gctacaataa | ctctttacc | agatgcagaa | agattttagtt | ttccaagagt | 720 | |
| gctgacggag | cgactacatg | gtacttcaat | ccagtgattc | tttagaccaa | 780 | |
| atagagtttc | tactaaacgg | gcagataata | aatacttacc | aagcaagatt | 840 | |
| atagctagaa | attttgatac | aatttagattg | tcatttcagt | tgatgagacc | 900 | |
| acaccagcgg | tagcggcgtt | atttccaaat | gcccagccat | ttgaacatca | 960 | |
| ggactcacgc | ttagaattga | atctgcagg | tgtgaatcag | tacttgcgcg | 1020 | |
| acaatgctag | caaatgtgac | atctgttaga | caagaatacg | cgataccagt | 1080 | |
| tttccaccag | gtatgcagt | gactgatttg | atcactaact | attcaccatc | tagagaggat | 1140 |
| aacctgcagc | gtgtatttac | agtggcttcc | attagaagca | tgcttgtcaa | atga | 1194 |

<210> 13
 <211> 1194
 <212> DNA
 <213> Artificial sequence

<220>
 <223> VP6 strain RF open reading frame, modified sequence

| | | | | | |
|-----------------------|------------|-------------|-------------|-------------|-----|
| <400> 13 | | | | | |
| atggatgtcc tgtactcctt | gtcaaaaact | cttaaagatg | ctagagacaa | aattgtcgaa | 60 |
| ggcacattat | actccaatgt | aagtgtatca | attcaacaat | ttaatcaa | 120 |
| atgaatggaa | atgagttcca | aactggagga | attggtaatc | taccgattag | 180 |
| tttgattttg | gattacttgg | aacaactcta | ctaaatttag | atgctaacta | 240 |
| gcccgcata | caattgatta | ttttgttagat | ttttagata | atgtatgtat | 300 |
| gttagagaat | cacaagaaa | ttgaattgca | ccacaatcg | attcacttat | 360 |
| ggcattaaat | ttaaagaat | aaattttgac | aattcatcg | aatacataga | 420 |
| ttgcaaaaata | gaagacaaag | aacgggtttt | acatttcata | aaccaaaacat | 480 |
| tcagcttcat | tcacgttcaa | cagatcaca | ccggctcatg | ataacttgat | 540 |
| tggctcaatg | cgggatcaga | aattcaggc | gctggattcg | actactcatg | 600 |
| gcccagcta | atacgcaaca | atttgagcat | attgtacagc | ttcgaagggt | 660 |
| gctacaataa | ctctttacc | agatgcagaa | agattttagtt | ttccaagagt | 720 |
| gctgacggag | cgactacatg | gtacttcaat | ccagtgattc | tttagaccaa | 780 |
| atagagtttc | tactaaacgg | gcagataata | aatacttacc | aagcaagatt | 840 |

| | | | | | | |
|------------|-------------|-------------|------------|-------------|-------------|------|
| atacgtagaa | atttgatac | aatttagattg | tcatttcagt | tgtgagacc | accaaataatg | 900 |
| acaccagcgg | tafcggcggtt | atttccaaat | gcgcagccat | ttgaacatca | cgcaacagta | 960 |
| ggactcacgc | ttagaattga | atctgcagg | tgtgaatcag | tacttgcgcga | cgcaagcgaa | 1020 |
| acaatgctag | cacaagtgcac | atctgttaga | caagaatacg | cgataccagt | tggaccagg | 1080 |
| tttccaccag | gtatgaattg | gactgatttg | atcactaact | attcaccatc | tagagaggat | 1140 |
| aacttgcagc | gtgtatttac | agtggcttcc | attagaagca | tgcttgtaa | atga | 1194 |

<210> 14
 <211> 1194
 <212> DNA
 <213> Artificial sequence

<220>
 <223> VP6 strain RF open reading frame, modified sequence

| | | | | | | |
|-------------|-------------|-------------|------------|-------------|-------------|------|
| <400> 14 | 60 | | | | | |
| atggatgtcc | tgtactcctt | gtcaaaaact | cttaaagatg | ctagagacaa | aattgtcgaa | 60 |
| ggcacattat | actcccaagt | cagtgtatca | attcaacaat | ttaatcaa | ataattact | 120 |
| atgaatggaa | atgagttcca | aactggagga | attggtaatc | taccgattag | aaattggaa | 180 |
| tttgattttg | gattacttgg | aacaactcta | ctaaatttag | atgctaacta | cgtcgaaacg | 240 |
| gccccgcaata | caattgatta | ttttgttagat | ttttagata | atgtatgtat | ggacgaaatg | 300 |
| gttagagaat | cacaagaaa | tggaattgca | ccacaatcag | attcactat | aaagtttatca | 360 |
| ggcattaaat | ttaaaagaat | aaattttgac | cagtcatcag | aatacataga | gaactggaa | 420 |
| ttgcaaaaata | gaagacaaag | aacgggttt | acatttcata | aaccaaacat | tttcccttat | 480 |
| tcaagttcat | tcacgttga | cagatcacag | cccgctcatg | ataacctgtat | gggtacgatg | 540 |
| tggctcaatg | cgggatcaga | aattcagg | gctggattcg | actactcatg | tgcataaaac | 600 |
| gcccgcgcta | atacgcaca | atttgagcat | attgtacagc | ttcgaagggt | tggactaca | 660 |
| gctacaataa | ctctttacc | agatgcagaa | agatttagtt | ttccaagagt | gattacttca | 720 |
| gctgacggag | cgactacatg | gtacttcaat | ccagtgttcc | tttagacaaa | taacgttga | 780 |
| atagagttc | tactaaacgg | gcagataata | aatacttacc | aagcaagatt | tggaaacgatc | 840 |
| atagctagaa | atttgatac | aatttagattg | tcatttcagt | tgtgagacc | accaaataatg | 900 |
| acaccagcgg | tagcggcg | atttccaaat | gcccgcgat | ttgaacatca | cgcaacagta | 960 |
| ggactcacgc | ttagaattga | atctgcagg | tgtgaatcag | tacttgcgcga | cgcaagcgaa | 1020 |
| acaatgctag | cacaagtgcac | atctgttaga | caagaatacg | cgataccagt | tggaccagg | 1080 |
| tttccaccag | gtatgcagg | gactgatttg | atcactaact | attcaccatc | tagagaggat | 1140 |
| aacttgcagc | gtgtatttac | agtggcttcc | attagaagca | tgcttgtaa | atga | 1194 |

<210> 15
 <211> 1194
 <212> DNA
 <213> Artificial sequence

<220>
 <223> VP6 strain RF open reading frame, modified sequence

| | | | | | | |
|-------------|------------|-------------|------------|-------------|-------------|-----|
| <400> 15 | 60 | | | | | |
| atggatgtcc | tgtactcctt | gtcaaaaact | cttaaagatg | ctagagacaa | aattgtcgaa | 60 |
| ggcacattat | actcccaagt | cagtgtatca | attcaacaat | ttaatcaa | ataattact | 120 |
| atgaatggaa | atgagttcca | aactggagga | attggtaatc | taccgattag | aaattggaa | 180 |
| tttgattttg | gattacttgg | aacaactcta | ctaaatttag | atgctaacta | cgtcgaaacg | 240 |
| gccccgcaata | caattgatta | ttttgttagat | ttttagata | atgtatgtat | ggacgaaatg | 300 |
| gttagagaat | cacaagaaa | tggaattgca | ccacaatcag | attcactat | aaagtttatca | 360 |
| ggcattaaat | ttaaaagaat | aaattttgac | cagtcatcag | aatacataga | gaactggaa | 420 |
| ttgcaaaaata | gaagacaaag | aacgggttt | acatttcata | aaccaaacat | tttcccttat | 480 |
| tcaagttcat | tcacgttga | cagatcacaa | cccgctcatg | ataacttgcgt | gggtacgatg | 540 |
| tggctcaatg | cgggatcaga | aattcagg | gctggattcg | actactcatg | tgcataaaac | 600 |
| gcccgcgcta | atacgcaca | atttgagcat | attgtacagc | ttcgaagggt | tggactaca | 660 |
| gctacaataa | ctctttacc | agatgcagaa | agatttagtt | ttccaagagt | gattacttca | 720 |

| | | | | | | |
|------------|------------|-------------|------------|------------|-------------|------|
| gctgacggag | cgactacatg | gtacttcaat | ccagtgattc | ttagacccaa | taacgttgaa | 780 |
| atagagttc | tactaaacgg | gcagataata | aatacttacc | aagcaagatt | tgaacgatc | 840 |
| atagctagaa | atttgatac | aatttagattt | tcatttcagt | tgatgagacc | accaaataatg | 900 |
| acaccagcgg | tagcggcggt | atttccaaat | gcmcagccat | ttgaacatca | cgcAACAGTA | 960 |
| ggactcacgc | ttagaattga | atctgcagtt | tgtgaatcag | tacttgcgcg | cgcAACAGCA | 1020 |
| acaatgttag | cacaagtgc | atctgttaga | caagaatacg | cgataccagt | tgaccaggta | 1080 |
| tttccaccag | gtatgcagtg | gactgatttg | atcactaact | attcaccatc | tagagaggat | 1140 |
| aacttgcagc | gtgtatttac | agtggcttcc | attagaagca | tgcttgtcaa | atga | 1194 |

<210> 16
<211> 1348
<212> DNA
<213> Artificial sequence

<220>
<223> VP6 strain RF open reading frame, modified sequence,
with signal peptide

| | | | | | | |
|------------|-------------|--------------|-------------|-------------|-------------|------|
| <400> 16 | 60 | | | | | |
| gcgcgcggat | cccaaggccc | aactccccga | accactcagg | gtcctgtgga | cagctcaccc | 120 |
| agccgcctg | gctccaggct | cccgacgtc | cctgctcctg | gctttgccc | tgctctgcct | 180 |
| gccctggctt | caggaggctg | gcgcgtgtat | ggatgtcctg | tactccctct | caaaaactct | 240 |
| taaagatgct | agagacaaaa | ttgtcgaagg | cacactgtac | tcccaagtca | gtgatctcat | 300 |
| tcagcagttt | aatcagatga | ttattactat | gaatggcaat | gagttccaga | ctggaggcat | 360 |
| tggcaatctc | cccattagaa | atttggaaattt | tgattttgga | ctccttgaa | caactctgct | 420 |
| caatctggat | gctaactacg | tcgaaacggc | ccgcaataca | attgattatt | ttgtcgattt | 480 |
| tgtggataat | gtctgtatgg | acgaaatgtt | tagagaatca | cagagaaatg | gcattgcacc | 540 |
| acagtcagat | tcacttatca | agctctcagg | cattaaattc | aaacgcatta | attttgacca | 600 |
| gtcatcagaa | tacatcgaga | acttggaaatct | gcaaaaataga | agacagagaa | cgggattcac | 660 |
| atttcataaa | ccaaacattt | tcccttattt | cgcttccttc | acgctccagc | gtcacagcc | 720 |
| cgctcatgat | aacctgtatgg | gcacgtatgt | gctcaatgct | ggctcagaaa | tccaggtcgc | 780 |
| tggattcgac | tactcatgtg | caattaacgc | cccagctaat | acgcagcagt | ttgagcataat | 840 |
| tgtgcagttt | agaagggtgc | tcactacagc | tacaatact | cttctgccag | atgcagaaag | 900 |
| attcagttt | cccagagtga | ttacttcagc | tgacggagct | actacatggt | atttcaatcc | 960 |
| agtgattctt | agaccaaata | acgttggaaat | tgagttctg | ctcaacggac | agatcattaa | 1020 |
| tacttaccag | gcaagattt | gaacgatcat | cgctagaaat | tttgatataaa | tttagactgtc | 1080 |
| atttcagctc | atgagaccac | caaacatgac | accagccgtc | gctccctct | ttccaaatgc | 1140 |
| tcagccattt | gaacatcacg | caacagtggg | actcacgtt | agaattgaat | cagcagtgt | 1200 |
| tgaatcagtc | cttgcgcacg | caagcgaaac | aatgtggca | caagtgacat | ctgttagaca | 1260 |
| ggaatacgc | attccagttt | gaccagttt | tccaccagga | atgcagtgg | ctgatctgat | 1320 |
| cactaactat | tcaccatcta | gagaggataa | cctccagcgc | gtgtttacag | tggcatccat | 1348 |
| tcgcagcatg | tttgtcaaat | gagcgcgc | | | | |

<210> 17
<211> 1061
<212> DNA
<213> Human rotavirus

<220>
<223> G9 strain 97CM113 outer capsid protein (VP7)

| | | | | | | |
|------------|-------------|------------|-------------|------------|------------|-----|
| <400> 17 | 60 | | | | | |
| ggctttaaaa | gagagaattt | ccgtctggct | agcggttatt | tccttttaat | gtatggtatt | 120 |
| gaatatacca | caattctaac | cttctgtata | tcaatagttt | tattgaacta | tatattaaaa | 180 |
| tcactaacta | gtgcgtatgg | cttcataatt | tatagtttc | ttttacttat | tgttattgca | 240 |
| tcacctttt | ttaaaaacaca | aaattatgg | attaattac | cgatcactgg | ctccatggat | 300 |
| acagcatatg | caaattcatac | acagcaagaa | acattttga | cttcaacgct | atgcttatat | 360 |
| tatcctacag | aagcgtcaac | tcaaattgg | gatacggaaat | ggaaggatac | tctgtcccaa | 420 |
| ttattcttga | ctaaagggtg | gccaactgg | tcagtctatt | ttaaagaata | caccgatatc | |

| | |
|---|------|
| gcttcattct caattgatcc gcaactttat tggattata atgttgtact gatgaagtat | 480 |
| gattcaacgt tagagctaga tatgtctgaa ttagctgatt taattctaaa tgaatggta | 540 |
| tgttaacccaa tggatataac attatattat tattcagcaaa cagatgaagc gaataaatgg | 600 |
| atatcgatgg gacagtcttg taccataaaa gtatgtccat tgaatacgca gacttttagga | 660 |
| ataggttcta ttaccacaaa tacagcgaca tttgaagagg tggctacaag tggaaaattta | 720 |
| gtaataaccg atgttgtga tgggtgtgaac cataaacttg atgtgactac aaataacctgt | 780 |
| acaatttagga attgtaaagaa gttggggacca agagaaaatg tagcgattat acaagtcgg | 840 |
| ggctcagatg tggtagatatacagcggt ccaactactg caccacaaac tgaacgtatg | 900 |
| atgcgagtaa attggaagaa atgggtggcaa gtttctata cagtagtata ttatattaat | 960 |
| cagattgtgc aagttatgtc caaaagatca cggtcattaa attcagcagc ttttactat | 1020 |
| agggtttgat atatcttata tttagaattgt atgtatgtgac c | 1061 |

<210> 18
<211> 1062
<212> DNA
<213> Human rotavirus

<220>
<223> G9 strain 02-22 capsid protein VP7 gene

| | |
|---|------|
| <400> 18 | |
| ggctttaaaa gagagaattt ccgtctggct agcggttagc tccttttaat gtatggtatt | 60 |
| gaatatacca caattctaac ctttctgata tcaatagttt tattgaacta tatattaaa | 120 |
| tcactaacta gtgcgtatgg ctttataatt tatagatttcc ttttacttat tggatttgca | 180 |
| tcatcttttgc taaaacaca aaattatggaa attaattttac cgatcactgg ctccatggat | 240 |
| acagcatatg caaatttcattt acagcaagaa acatttttgat cttcaacgct atgcttataat | 300 |
| tatcctacag aagcatcaac tcaaaattggaa gatacggat ggaaggatac tctgtcccaa | 360 |
| ttattcttgc ctaaagggtg gccaacttggaa tcagtctatt ttaaagaata cactgatatc | 420 |
| gcttcattcttcaattgatcc acaactttat tggattata atgttgtact gatgaagtat | 480 |
| gattcaacgt tagagctaga tatgtctgaa ttagctgatt taattctaaa tgaatggta | 540 |
| tgttaacccaa tggatataac attatattat tattcagcaaa cagatgaagc gaataaatgg | 600 |
| atatcgatgg gacagtcttg taccataaaa gtatgtccat tgaatacgca gacttttagga | 660 |
| ataggttcta ttaccacaaa tacagcgaca tttgaagagg tggctacaag tggaaaattta | 720 |
| gtaataaccg atgttgtga tgggtgtgaac cataaacttg atgtgactac aaataacctgt | 780 |
| acaatttagga attgtaaagaa gttggggacca agagaaaatg tagcgattat acaagtcgg | 840 |
| ggctcagatg tggtagatatacagcggt ccaactactg caccacaaac tgaacgtatg | 900 |
| atgcgagtaa attggaagaa atgggtggcaa gtttctata cagtagtata ttatattaat | 960 |
| cagattgtgc aagttatgtc caaaagatca cggtcattaa attcagcagc ttttactat | 1020 |
| agggtttgat atatcttata tttagaattgt atgtatgtgac ca | 1062 |

<210> 19
<211> 1062
<212> DNA
<213> Human rotavirus

<220>
<223> G3 strain MaCH09004 outer capsid protein (VP7) gene,
complete cds

| | |
|--|-----|
| <400> 19 | |
| ggctttaaaa gagagaattt ccgtctggct agcggttagc tccttttaat gtatggtatt | 60 |
| gaatatacca cagtttaaac ctttttgcata tcagttatata tggatttca cgtactcaaa | 120 |
| tccttaacta gaataatggaa ctttattatt tacagatttcc ttttattat agttatatta | 180 |
| tcaccactcc ttaatgcaca aaattatggaa ataaatcttc cgattactgg ctcaatggac | 240 |
| acaccatata cgaactcaac gcgagaggaa gtattcctaa ctgcacttt atgtttgtat | 300 |
| tacccaaactg aagcagcaac agaaataat gataattcat ggaaggatac actttctcag | 360 |
| ctatctttaa tcaaaaggatg gccaacagga tctattttat taaagatata tactgatatt | 420 |
| gcctcggtt cagtcgatcc acaactgtat tggattata attggattt aatgaaatata | 480 |
| gacgctacac tgcaactggaa catgtccgaa ctagcagatt tgttacttaa tgagtggta | 540 |

| | | | | | | |
|-------------|------------------------|-------------------------|-------------|------------|---------------------------------|------|
| tgttaatccta | tggatattac | tttgttattat | tatcaacaaa | ctgatgaggc | aa <u>aaaaa</u> u _{yy} | uuu |
| atttcaatgg | gatcatctt _g | tactataaaag | gtatgtccac | taaatacgca | aacatttagga | 660 |
| attgggtgtc | taacaactga | tacaaacacg | tttgaagaag | ttgcaacacg | tgaaaaattta | 720 |
| gtgattactg | acgttgtaga | tggagtcaat | cataaaattga | acgtgacaac | aaacacttgt | 780 |
| acgattcgaa | attgtaaagaa | attaggacca | agggaaaacg | tagcagttat | acaggttaggt | 840 |
| ggcccagatg | tgcttgacat | aacagctgat | ccaacgacaa | tgccacaaac | agaaaagaatg | 900 |
| atgcgagtga | attgaaagaa | atggtggcaa | gtgtttata | caatagttga | ctacgtgaat | 960 |
| caaattgtgc | aagcaatgtc | caaaagatcg | agatcattaa | attctgctgc | attttactac | 1020 |
| agagtataga | tatagcttag | attagaattt _g | tatgatgtga | cc | | 1062 |

<210> 20
<211> 981
<212> DNA
<213> Human rotavirus

<220>
<223> G12 VP7 gene for capsid protein, complete cds

| | | | | | | |
|-------------|------------------------|-------------|-------------|-------------|--------------|-----|
| <400> 20 | | | | | | |
| atgtatggta | ttgaatatac | cacaatttta | accttttga | tatcaattgt | tctattaaat | 60 |
| tatataattaa | aatcaataac | taatataatg | gactttatca | tatatcggtt | tttactaata | 120 |
| gttgggtgtca | tgctgccatt | tattaaagct | caaaattatg | gaataaaatct | tccaaaataaca | 180 |
| ggttctatgg | ataccgcata | tacaaactcc | acacaacaag | agaattttat | gacttccact | 240 |
| ttatgcttat | attatccaag | ttcagtcacg | actgaaataaa | ctgaccgg | ttggacgaaac | 300 |
| acactgtcac | aactttcat | gactaaagga | tggccgacaa | attccgtcta | cttcaagagt | 360 |
| tatgctgata | tagcgtcctt | ctctgttagat | cccgagttat | attgtgatta | caatattgtg | 420 |
| ttagtacagt | accaaaattc | attagcgtt | gatgtctcag | aacttgcgt | tttaattttt | 480 |
| aatgaatgg | tatgtatcc | gatggacgta | acgttgtact | attataaca | aacagatgaa | 540 |
| gcgaataaaat | ggatatcaat | gggagaatca | tgtacggta | aagtatgtcc | ctttaataacg | 600 |
| caaactttag | gaattggatg | tacaacaacc | gacgtcacaa | catttgaaga | ggttagcaaac | 660 |
| gcggaaaaat | tagtaataac | tgacgtcgt | gatggagtca | atcacaagat | taatattaca | 720 |
| atgaatacat | gtactatacg | gaatttgc | aagttaggac | cgagggaaa | tgttagcaatt | 780 |
| atacaagtag | gtgggtctga | cgtcatagac | ataacagcag | atccaaacaac | gatcccacaa | 840 |
| actgaaagaa | tgatgcgaat | aaattggaaa | aaatggtggc | aggtgtttt | taccgttagt | 900 |
| gattacataa | atcaaatagt | tcaggtatg | tccaaacgat | caagatcact | aaattcagct | 960 |
| gcttttact | acagaattt _g | | | | | 981 |

<210> 21
<211> 1062
<212> DNA
<213> Human rotavirus

<220>
<223> G3 strain MaCH09404 outer capsid protein (VP7) gene, complete cds

| | | | | | | |
|-------------|------------------------|-------------|------------|------------|-------------|-----|
| <400> 21 | | | | | | |
| ggctttaaaaa | gagagaattt | ccgtctggct | agcggttagc | tccttttaat | gtatggtatt | 60 |
| gaatatacca | cagtttaac | ctttttgata | tcagtttat | tgttgaatta | cgtactcaaa | 120 |
| tccttaacta | gaataatgg | cttattatt | tacagatttc | ttttaattat | agttatatta | 180 |
| tcaccactcc | ttaatgcaca | aaattatgg | ataaaatctc | cgattactgg | ctcaatggac | 240 |
| acaccatata | cgaactcaac | gcgagaggaa | gtattcctaa | cttcgacttt | atgtttgtat | 300 |
| tacccaactg | aagcagcaac | agaaataaaat | gataattcat | ggaaggatac | actttctcag | 360 |
| ctatttttaa | tcaaaggatg | gccaacagga | tctatttt | ttaaagatta | tactgatatt | 420 |
| gcctcgttt | cagtcgatcc | acaactgtat | tgtgattata | atttggatt | aatgaaatat | 480 |
| gacgctacac | tgcaactgga | catgtccgaa | ctagcagatt | tgttactaa | tgagtggta | 540 |
| tgttaatccta | tggatattac | tttgttattat | tatcaacaaa | ctgatgaggc | aaataaaatgg | 600 |
| atttcaatgg | gatcatctt _g | tactataaaag | gtatgtccac | taaatacgca | aacatttagga | 660 |

| | |
|--|------|
| atgggtgtc taacaactga tacaaacacg tttgaagaag ttgcaacacgc tgaaaaa <u>ll</u> <u>ll</u> | 120 |
| gtgattactg acgtttaga tggagtcaat cataaattga acgtgacaac aaacacttgt | 780 |
| acgattagaa attgtaagaa attaggacca agggaaaacg tagcagttat acaggttaggt | 840 |
| ggcccgatg tgcttgacat aacagctgat ccaacgacaa tgccacaaac agaaagaatg | 900 |
| atgcgagtga attggaagaa atggtgccaa gtgtttata caatagtga ctacgtgaat | 960 |
| caaattgtgc aagcaatgtc caaaagatcg agatcattaa attctgctgc attttactac | 1020 |
| agagtataga tatacgcttag attagaattt tatgatgtga cc | 1062 |

<210> 22
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> HIV epitope

<400> 22

Arg Thr Pro Lys Ile Gln Val
1 5

<210> 23
<211> 6
<212> PRT
<213> Artificial sequence

<220>
<223> HIV epitope

<400> 23

Glu Leu Asp Lys Trp Ala
1 5